CLAIMS

1. Peptide which is part of the epitope in human IL-15 that is responsible for high-affinity binding of IL-15 to the IL-15Ralpha chain, characterized in that it has the sequence of the region of human mature wild-type IL-15 from L44 to L52 (SEQ ID NO:4), or the sequence of the region of human mature wild-type IL-15 from E64 to I68 (SEQ ID NO:6), or the sequence of the region of human mature wild-type IL-15 from E64 to L69 (SEQ ID NO:67).

2. Peptide according to claim 1, characterized in that it has the sequence of the region of human mature wild-type IL-15 from L44 to L52 (SEQ ID NO:4), or the sequence of the region of human mature wild-type IL-15 from E64 to I68 (SEQ ID NO:6)

3. Nucleic acid coding for a peptide according to claim 1 or 2.

4. IL-15 mutein, characterized in that it has a sequence that is derivable from human mature wild-type IL-15 by at least one substitution, deletion or addition within the region spanning from residue 44 to residue 52, and/or from residue 64 to residue 68, and/or from residue 64 to residue 69, this residue numbering corresponding to the human mature wild-type IL-15, provided that the IL-15 mutein resulting therefrom has an affinity for binding to IL-15Ralpha that is either not significantly different from, or higher than the affinity of human mature wild-type IL-15 for binding to IL-15Ralpha.

5. IL-15 mutein according to claim 4, characterized in that it has a sequence that is derivable from human mature wild-type IL-15 by at least one substitution, deletion or addition within the region spanning from residue 44 to residue 52, and/or from residue 64 to residue 68, this residue numbering corresponding to the human mature wild-type IL-15, provided that the IL-15 mutein resulting therefrom has an affinity for binding to IL-15Ralpha that is either not significantly different from, or higher than the affinity of human mature wild-type IL-15 for binding to IL-15Ralpha.

6. IL-15 mutein according to claim 4 or 5, characterized in that said at least one substitution is a substitution of at least one hydrophobic side chain selected from L, V and I, and/or of at least one non-charged polar side chain selected from S, N, and Q by a charged group selected from D, E, K, and R.

7. IL-15 mutein according to claim 4 or 5, characterized in that said at least one substitution is a substitution of at least one charged polar side chain selected from E by the oppositely charged group K.

8. IL-15 mutein according to any one of claims 4-7, characterized in that it is an IL-15 agonist.

9. IL-15 mutein according to claim 8, characterized in that said at least one substitution is a substitution of at least one of residues 45, 51, 52.

10. IL-15 mutein according to claim 9, characterized in that said at least one substitution is a substitution of residue 45 by D or E.

11. IL-15 mutein according to claim 10, characterized in that it has the sequence of SEQ ID NO:29 or SEQ ID NO:30.

12. IL-15 mutein according to claim 9, characterized in that said at least one substitution is a substitution of residue 51 by D.

13. IL-15 mutein according to claim 12, characterized in that it has the sequence of SEQ ID NO:33.

14. IL-15 mutein according to claim 9, characterized in that said at least one substitution is a substitution of residue 52 by D.

15. IL-15 mutein according to claim 14, characterized in that it has the sequence of SEQ ID NO:37.

16. IL-15 mutein according to any one of claims 4-7, characterized in that it is an IL-15 antagonist.

17. IL-15 mutein according to claim 16, characterized in that said at least one substitution is a substitution of at least one of residues 64, 65, 68.

18. IL-15 mutein according to claim 17, characterized in that said at least one substitution is a substitution of residue 64 by K.

19. IL-15 mutein according to claim 18, characterized in that it has the sequence of SEQ ID NO:41.

20. IL-15 mutein according to claim 17, characterized in that said at least one substitution is a substitution of residue 65 by K.

21. IL-15 mutein according to claim 20, characterized in that it has the sequence of SEQ ID NO:45.

22. IL-15 mutein according to claim 17, characterized in that said at least one substitution is a substitution of residue 68 by D.

23. IL-15 mutein according to claim 22, characterized in that it has the sequence of SEQ ID NO:47.

24. IL-15 mutein according to claim 16, characterized in that said at least one substitution is a substitution of residue 69.

25. IL-15 mutein according to claim 24, characterized in that IL-15 mutein according to claim 24, characterized in that said at least one substitution is a substitution of residue 69 by R.

26. IL-15 mutein according to claim 25, characterized in that it has the sequence of SEQ ID NO:85.

27. Conservative fragment of the IL-15 mutein of any one of claims 4-26, which still comprises the mutated 44-52 region and/or mutated 64-68 region and/or mutated 64-69 region, provided that the IL-15 mutein fragment resulting therefrom still has an affinity for binding to IL-15Ralpha that is either not significantly different from, or higher than the affinity of human mature wild-type IL-15 for binding to IL-15Ralpha.

28. IL-15 mutein fragment according to claim 27, characterized in that it still comprises the mutated 44-52 region and/or mutated 64-68 region, provided that the IL-15 mutein fragment resulting therefrom still has an affinity for binding to IL-15Ralpha that is either not significantly different from, or higher than the affinity of human mature wild-type IL-15 for binding to IL-15Ralpha.

29. IL-15 mutein fragment according to claim 27 or 28, characterized in that it is an IL-15 agonist.

30. IL-15 mutein fragment according to claim 29, characterized in that it comprises the sequence of any one of SEQ ID NO:7-18.

31. IL-15 mutein fragment according to claim 27 or 28, characterized in that it is an IL-15 antagonist.

32. IL-15 mutein fragment according to claim 31, characterized in that it comprises the sequence of any one of SEQ ID NO:19-28.

33. IL-15 mutein fragment according to claim 31, characterized in that it comprises the sequence of any one of SEQ ID NO:77-80.

34. Nucleic acid coding for an IL-15 mutein according to any one of claims 4-26, or for an IL-15 mutein fragment according to any one of claims 27-33.

35. Vector containing at least one nucleic acid of claim 34.

36. Cell transfected or transformed by a vector according to claim 35.

37. Drug which comprises an IL-15 mutein according to any one of claims 8-15, and/or an IL-15 mutein fragment according to claim 29 or 30, and which optionally comprises a pharmaceutically acceptable vehicle and/or carrier and/or diluent and/or adjuvant.

38. Use of an IL-15 mutein according to any one of claims 8-15, or of an IL-15 mutein fragment according to claim 29 or 30, for the manufacture of an anti-cancer or anti-immunodeficiency drug.

39. Drug which comprises an IL-15 mutein according to any one of claims 16-26, and/or an IL-15 mutein fragment according to any one of claims 31-33, and which optionally comprises a pharmaceutically acceptable vehicle and/or carrier and/or diluent and/or adjuvant.

40. Use of an IL-15 mutein according to any one of claims 16-26, or of an IL-15 mutein fragment according to any one of claims 31-33, for the manufacture of an anti-inflammatory drug.

41. Process for screening for an IL-15 agonist or antagonist, characterized in that it comprises:

i. providing a plurality of IL-15 muteins according to any one of claims 4-26, and/or of IL-15 mutein fragments according to any one of claims 29-35,

ii. comparing their respective binding affinity for IL15-Ralpha to the binding affinity of mature wild-type IL-15,

iii. selecting those muteins or mutein fragments which have a binding affinity that is not significantly different from, or that is higher than the one of mature wild-type IL-15.

42. Process according to claim 41, which is for screening for an IL-15 agonist, characterized in that it further comprises:

iv. selecting at least one detectable IL15-inducible activity,

v. comparing the level of said activity that is induced in response to the muteins or fragments selected in step iii., to the one induced by mature wild-type IL-15,

vi. selecting those muteins or fragments which induce an activity level that is not significantly different from, or that is higher than the one of mature wild-type IL-15.

43. Process according to claim 41, which is for screening for an IL-15 antagonist, characterized in that it further comprises:

iv. selecting at least one detectable IL15-inducible activity,

v. comparing the level of said activity that is induced in response to the muteins or fragments selected in step iii., to the one induced by mature wild-type IL-15,

vi. selecting those muteins or fragments which induce an activity level that is lower than the one of mature wild-type IL-15, or which induce no detectable level of activity.